ABSTRACT 1

The Use of Red Green Blue Air Mass Imagery to Investigate the Role of Stratospheric Air in a Non-Convective Wind Event

Authors: E. B. Berndt, B. T. Zavodsky, A. L. Molthan, and G. J. Jedlovec

The investigation of non-convective winds associated with passing extratropical cyclones and the formation of the sting jet in North Atlantic cyclones that impact Europe has been gaining interest. Sting jet research has been limited to North Atlantic cyclones that impact Europe because it is known to occur in Shapiro-Keyser cyclones and theory suggests it does not occur in Norwegian type cyclones. The global distribution of sting jet cyclones is unknown and questions remain as to whether cyclones with Shapiro-Keyser characteristics that impact the United States develop features similar to the sting jet. Therefore unique National Aeronautics and Space Administration (NASA) products were used to analyze an event that impacted the Northeast United States on 09 February 2013. Moderate Resolution Imaging Spectroradiometer (MODIS) Red Green Blue (RGB) Air Mass imagery and Atmospheric Infrared Sounder (AIRS) ozone data were used in conjunction with NASA's global Modern Era-Retrospective Analysis for Research and Applications (MERRA) reanalysis and higher-resolution regional 13-km Rapid Refresh (RAP) data to analyze the role of stratospheric air in producing high winds. The RGB Air Mass imagery and a new AIRS ozone anomaly product were used to confirm the presence of stratospheric air. Plan view and cross sectional plots of wind, potential vorticity, relative humidity, omega, and frontogenesis were used to analyze the relationship between stratospheric air and high surface winds during the event. Additionally, the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model was used to plot trajectories to determine the role of the conveyor belts in producing the high winds. Analyses of new satellite products, such as the RGB Air Mass imagery, show the utility of future GOES-R products in forecasting non-convective wind events.